

# The Illusion of Opacity

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## Opacity – a sample

Suppose Tom believes “Cicero denounced Cataline”

And also (not knowing Cicero = Tully) Tom does not believe “Tully denounced Cataline.”

Note this is a description in a public (shared) language.

Internally, Tom has internal (language of thought) symbols for Cicero, Tully and Cataline.

Also for denouncing.

Let A1 be Tom's symbol for Cicero, A2 be Tom's symbol for Tully and B1 be Tom's symbol for Cataline. Also let D be Tom's Symbol for denounced.

Then Tom's belief that Cicero denounced Cataline will be a relation between Toms symbols A1, B1 and D1. Tom's lack of a belief that Tully denounced Cataline is a relation (or lack of one) between A2, B1 and D1. We may suppose Tom has various beliefs involving A1 and A2, which are compatible with A1 and A2 corresponding both to the same person. However, as A1 and A2 are not identical there is not failure of substitutivity of identicals. If Tom expresses his belief to Bob, using English, Bob will have his own internal symbols for Cicero, Tully and Cataline, say A3, A4, and B2, Also D2 for denounced. It may be that Bob Knows that the referent of A3 and A4 are the same. Still A3 and A4 are not identical for Bob either. Let  $f(S,x)$  be the function for subject S from his internal symbol x to its meaning. Then  $f(\text{Bob},A3)=f(\text{Bob},A4)$ . Also  $f(\text{Tom},A1)=f(\text{Tom},A2)$ . This statement about Tom would from anther's vantage point. He would not realize it. Others might know enough to make this observation about him. However, even so,  $A1 \neq A2$  and  $A3 \neq A4$ . It is a significant statement for Bob to say “Cicero = Tully” (Unlike “Cicero = Cicero”) . There is largely agreement between our internal symbols and others internal symbols, as they are mediated by a shared public language.

In the notation I used elsewhere we have. (leaving out time)

$\text{belief\_r}(\text{Tom},D1,A1,B1) \ \& \ \text{symbol\_r}(\text{Tom},D1,\text{denounced}) \ \& \ \text{symbol\_r}(\text{Tom},A1,\text{Cicero}) \ \& \ \text{symbol\_r}(\text{Tom},B1,\text{Cataline})$

$\sim\text{belief\_r}(\text{Tom},D1,A2,B1) \ \& \ \text{symbol\_r}(\text{Tom},D1,\text{denounced}) \ \& \ \text{symbol\_r}(\text{Tom},A2,\text{Tully}) \ \& \ \text{symbol\_r}(\text{Tom},B1,\text{Cataline})$

Note we also have

$\text{belief\_r}(\text{Tom},D1,A1,B1) \ \& \ \text{symbol\_r}(\text{Tom},D1,\text{denounced}) \ \& \ \text{symbol\_r}(\text{Tom},A1,\text{Tully}) \ \& \ \text{symbol\_r}(\text{Tom},B1,\text{Cataline})$

$\sim\text{belief\_r}(\text{Tom},D1,A2,B1) \ \& \ \text{symbol\_r}(\text{Tom},D1,\text{denounced}) \ \& \ \text{symbol\_r}(\text{Tom},A2,\text{Cicero}) \ \& \ \text{symbol\_r}(\text{Tom},B1,\text{Cataline})$

As Tully = Cicero.

But Tom would deny these. (But this is not an inconsistency of my theory. It is a result of Tom's

ignorance).

We also have.

belief\_r(Bob,D2,A3,B2) & symbol\_r(Bob,D2,denounced) & symbol\_r(Bob,A3,Cicero) &  
symbol\_r(Bob,B2,Cataline)

belief\_r(Bob,D2,A4,B2) & symbol\_r(Bob,D2,denounced) & symbol\_r(Bob,A4,Tully) &  
symbol\_r(Bob,B2,Cataline)

And, of course

belief\_r(Bob,D2,A3,B2) & symbol\_r(Bob,D2,denounced) & symbol\_r(Bob,A3,Tully) &  
symbol\_r(Bob,B2,Cataline)

belief\_r(Bob,D2,A4,B2) & symbol\_r(Bob,D2,denounced) & symbol\_r(Bob,A4,Cicero) &  
symbol\_r(Bob,B2,Cataline)

And Bob would acknowledge these as he knows Cicero = Tully.

I use the existential quantifiers elsewhere as there is no need to specify the internal symbols. I have named them here to try to make it easier to understand. One can understand in the case of a person and a grandparent, that there are intermediate relations to a parent, without knowing who the parent is.